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Foreign Disease :

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Acute
Emergency
Programs



March 1985

In This Issue

Avian Influenza Update
Economic Assessment of 1983-84 AI Program
Avian Influenza Virus in Eggs
Vesicular Stomatitis
International Conference on Vesicular Stomatitis
Foreign Animal Disease Investigations
Newcastle Disease in Pet Birds
Newcastle Disease in Pigeons
World Animal Disease Roundup
Heartwater and Dermatophilosis
Parent Committee
FMD Surveillance in Mexico
What Was It?

Current Events

Avian Influenza Update

Surveillance efforts for the lethal type of H_5N_2 avian influenza (AI) virus disclosed two seropositive flocks in Pennsylvania, but none in Virginia (see 1984 issues). In Virginia nonlethal AI virus $H_{10}N_8$ was isolated from a meat type turkey carcass grown on the same premises where a previous flock of turkeys was infected with the same serotype of AI virus about 9 months earlier. Also, antibodies for serotype H_7N_3 were detected in a backyard flock in Virginia. Additional specimens have failed to yield any AI virus.

In Maryland, AI virus serotype H_5N_2 was isolated from noncommercial poultry owned or sold by a poultry dealer. Exposed birds were traced through sales made in Maryland, Pennsylvania, Virginia, and Delaware. To date, 234 premises have been investigated, but no additional evidence of infection has been found. (Dr. K. A. Hand, 301 436-8065)

Economic Assessment of AI Program

Benefits of the Federal-State program to eradicate the 1983-84 outbreak of avian influenza in Pennsylvania and Virginia substantially exceeded the cost of the program. Total losses to affected producers and increases in consumer costs were much lower than would likely have been suffered if no Federal eradication program had been implemented and the disease had become widespread.

The Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture (USDA), had spent over \$60 million by September 1, 1984, to eradicate the 1983-84 outbreak of avian influenza that started in Pennsylvania. The greater part of the expenditures (over \$40 million) was for indemnity payments to producers whose flocks were depopulated. About one-third of the

7/28

expenditures were for salaries, travel, rent, and similar costs to administer the eradication program. All the indemnities and a substantial portion of the other costs were expended in the communities stricken by the disease and helped offset part of the economic losses.

Producers suffered direct losses from the 1983-84 outbreak, estimated at \$55 million, in the form of lost birds and eggs. These direct costs were offset by the \$40 million paid as indemnities to the producers. Additional costs due to cleanup, disinfection, transportation, income foregone, and financial hardships were not included in the estimate.

Consumers paid about \$349 million more for their protein foods during the period from November 1983 to April 1984 because of the avian influenza outbreak. The relatively small drop in the quantity of protein foods supplied increased consumer costs an estimated \$120 million for eggs, \$80 million for broilers, \$13 million for turkeys, and \$12 million for other chickens. Although avian influenza caused no change in the quantity of pork and beef available, there was a slight increase in their prices, driving up expenditures by \$60 million for pork and \$64 million for beef.

Producers did not share the burden evenly. Those whose flocks contracted avian influenza bore almost all the cost and burden. Some of the producers whose flocks remained healthy realized prices and profits much above those prior to the avian influenza outbreak. These prices were bid up because of the direct impact of avian influenza in reducing output, the fear of shortages from further outbreaks, and the previously planned reduction in production, which was just becoming effective when the outbreak occurred.

Contract growers may have been one of the most severely affected poultry groups due to avian influenza and the quarantine. Their total income from poultry was stopped by the outbreak and subsequent downtime. Contract growers provide the housing and equipment, their labor, and some litter and fuel, but do not own the birds. Therefore, contract growers were not paid indemnities directly by the Government even though those costs were included as part of the production costs. The grower depended upon the contractor to pass along an appropriate portion of the indemnity which was paid to the owner of the birds.

Others especially affected by avian influenza and the eradication program included hatcheries, feed suppliers, other supply firms, processors, distributors, and credit agencies. These firms suffered losses not covered through the indemnity program.

Without the eradication program, the 1983-84 avian influenza outbreak would likely have caused much greater economic havoc. There is a high probability that it would have become widespread, threatening much of our poultry industry, severely disrupting markets, and completely stopping U.S. exports to

other countries. Had the outbreak spread throughout the Eastern United States (generally east of the Mississippi River), losses would have been far greater. Although losses of affected producers would have been substantial (estimated at \$508 million), consumers would have borne most of the cost because shortages would have increased protein food costs by about \$5.6 billion during the period from November 1983 to April 1984. Those producers not affected by avian influenza would have had the potential for unusually high profits because of higher product prices. (Abstract from Economic Research Service Staff Report No. 841212, authors Floyd A. Lasley, Sara D. Short, and William L. Henson, National Economics Div., ERS, USDA, Washington, DC 20250)

Avian Influenza Virus in Eggs

During the 1983-1984 AI outbreak in Pennsylvania and Virginia, AI virus type H₅N₂ was isolated from the yolk and albumen of eggs from three commercial layer flocks and three broiler breeder flocks. The virus was isolated from eggs stored up to 8 days. This is the first reported isolation of AI virus from the contents of eggs from naturally infected flocks. An infected turkey breeder flock was similarly studied, but the virus was not isolated from the egg contents.

Egg-borne transmission of AI virus has not been proven. However, the finding of AI virus in eggs from infected chickens justifies Federal regulations allowing the movement of only those table eggs and hatching eggs obtained from flocks neither infected with nor exposed to AI. (Abstracted from "Isolation of Avian Influenza Subtype H₅N₂ from Chicken Eggs During a Natural Outbreak." D. T. Cappucci, Jr., D. C. Johnson, M. Brugh, T. M. Smith, C. F. Jackson, J. E. Pearson, and D. A. Senne. Submitted for publication in Avian Diseases.)

Vesicular Stomatitis

All reported cases of vesicular diseases in cloven-hoofed animals in the United States are investigated by specially trained foreign animal disease diagnosticians to exclude the possible introduction of foot-and-mouth disease. As a result of one of these investigations, in December 1984, a horse pastured near the Rio Grande River at Marfa, Texas, was found to be infected with New Jersey type vesicular stomatitis virus. A private veterinary practitioner collected the initial tissue and serum. Although the virus was not isolated, increased antibody titers in convalescent serums confirmed the diagnosis. A small outbreak of New Jersey type vesicular stomatitis in horses in central Texas in early February 1984 was the only other occurrence reported in the United States for the year. (Dr. Arthur E. Hall, 301 436-8073)

International Conference on Vesicular Stomatitis

A conference on vesicular stomatitis was held in Mexico City, September 24-27, 1984. The event was sponsored by the Mexico-U.S. Foot-and-Mouth Disease Commission in collaboration with the Mexican Animal Health Program, the Plum Island Animal Disease Center, and the Pan-American Health Organization. Participants included research workers and animal health officials directly involved with vesicular stomatitis in livestock.

One of the purposes of the meeting was to evaluate data on the outbreak of vesicular stomatitis which affected thousands of heads of cattle and horses in the Western United States in 1982 and early 1983. The last clinical case in cattle was seen on May 25, 1983. Vesicular stomatitis appears in epidemic form in this country every 10 or 15 years. The most recent outbreak was the largest ever reported. The disease is widely distributed in Mexico, Central America, Panama, and northern South America.

Many of the epidemiological features of vesicular stomatitis are still unclear, particularly the means of transmission and natural reservoir. One of the mysteries about the disease is where the virus disappears to and what happens to it between outbreaks.

A special feature of the conference was the attendance of a number of molecular biologists. Vesicular stomatitis viruses are widely used as models to study the basic characteristics of viruses, but there has been little contact in the past between field investigators and laboratory workers.

Epidemiological features of vesicular stomatitis in different countries in the Americas, a description of the 1982/1983 outbreak in the United States, and reports on pathogenesis and the search for persistent infections were discussed. A summary was presented of a long-term field study on Ossabaw Island, Georgia, where the disease appears to be endemic.

There was considerable discussion on newer techniques in molecular virology and their possible application to the investigation of vesicular stomatitis. These techniques include oligonucleotide fingerprinting, diagnostic RNA probes, use of monoclonal antibodies, and high performance liquid chromatography. The significance of defective interfering particles and temperature-sensitive mutants was discussed. Different vesiculovirus serotypes were described, including some newly isolated strains from Brazil and Asia. A session on laboratory procedures was aimed at the standardization of methods among different official diagnostic laboratories.

The use of live and killed vaccines was discussed. A number of conditional licenses were issued by the U.S. Department of Agriculture in 1982 for the production of vesicular stomatitis vaccines, but because of a sharp drop in reported cases in late 1982 and early 1983, the vaccine was not widely used.

Some of the concluding discussions dealt with economic impacts, particularly in dairy herds, and the problems the disease has caused in the exportation of U.S. livestock.

Proceedings of the conference should be available in a few months. (Dr. John Mason, 905 531-7600)

Foreign
Animal
Disease
Investigations

A total of 167 reports of suspected foreign animal disease were investigated in the United States from October 1, 1983, to September 30, 1984, in addition to the investigations conducted because of avian influenza in Pennsylvania, New Jersey, Maryland, and Virginia. (Dr. Arthur E. Hall, 301 436-8073)

Newcastle
Disease in Pet
Birds in Fiscal
Year 1984

Velogenic viscerotropic Newcastle disease (VVND) is introduced into the United States almost every spring and summer as a result of pet bird smuggling. Unlike past years, when only parrots brought into California were incriminated, 1984 outbreaks came through both California and Texas.

Baby Amazon parrots illegally imported into California were found to be infected with VVND during the spring of 1984. A small task force was activated in southern California to trace 47 shipments made by a bird wholesaler. This wholesaler and another dealer in California whose birds had VVND both purchased yellow naped Amazon parrots from the same questionable source. Some of the infected birds were moved to Utah.

Another California supplier shipped juvenile yellow napes to a wholesaler in Kansas City, Missouri, where VVND virus was also isolated. Sales from the Kansas wholesaler were traced to Iowa, Kansas, Oklahoma, Texas, Louisiana, and Nebraska.

A wholesale dealer in Alabama that acquired a number of very young spectacled Amazon parrots had VVND diagnosed in his birds on May 30, 1984. Sales and contacts led to the investigation of approximately 100 premises in Alabama, 13 in Florida, and 30 in Georgia. Seven additional cases resulted from related movements and included four cases in Alabama, one case in Georgia, and two cases in Florida.

Another VVND case unrelated to the others above was also diagnosed in Alabama on May 31, 1984. Six investigations involving Alabama, Georgia, and North Carolina failed to disclose additional infection.

Two buyers in Florida split a shipment of 10 baby yellow napes from California. It was necessary to depopulate 100 birds on the two Florida premises to eliminate the disease. No additional spread occurred.

Another outbreak in Florida resulted from the movement of infected baby Amazon parrots from the Brownsville, Texas, area to Florida. No sales were made from the Florida premises and no additional cases followed. The source of the birds was not found. (Dr. Arthur A. Hall, 301 436-8073)

Newcastle
Disease in
Pigeons

From early May through June 1984, Newcastle disease virus was found in pigeons from several lofts in and around New York City. Mortality was reported to be as high as 90 percent in some lofts. Eight investigations in New York, three in New Jersey, and one in Vermont were made in this period to determine whether exotic Newcastle disease virus might be present. It is believed

that from 65 to 75 lofts may have been affected. Imported Newcastle disease vaccine for pigeons, manufactured in Belgium, and not licensed in the United States was found on one of the premises investigated. Newcastle virus isolated from the bottles was characterized as lentogenic. Chickens inoculated with the vaccine virus remained healthy. For a study of the isolated viruses, groups of pigeons were inoculated at the National Veterinary Services Laboratories (NVSL), Ames, Iowa, with vaccine virus and virus from each of the eight pigeon lofts. The test pigeons given vaccine virus remained healthy. However, some of the pigeons in five of the groups given virus from loft pigeons sickened and died, many with central nervous system (CNS) signs. Study of the viruses is continuing. (Dr. Arthur E. Hall, 301 436-8073)

World
Animal
Disease
Roundup

After a period of relative stability in Europe, Foot-and-mouth disease (FMD) is again capturing the headlines. An outbreak of type A₅ in Italy, first reported from the Modena region at the end of November 1984, spread to 15 premises in that area by December 15 and to 76 premises by early February 1985. At the time of this writing, detailed information about the situation had not been received. From Africa, FMD was reported in Zimbabwe and Ethiopia. In South America, reports of the disease continued to be received from Argentina, Brazil, Paraguay, and Bolivia. In Colombia, one case was found in an area kept free for 10 years through the combined efforts of the Colombia-USDA FMD Program (11-1, pages 5 to 9). In Asia, FMD was reported from Hong Kong, Thailand, and Turkey.

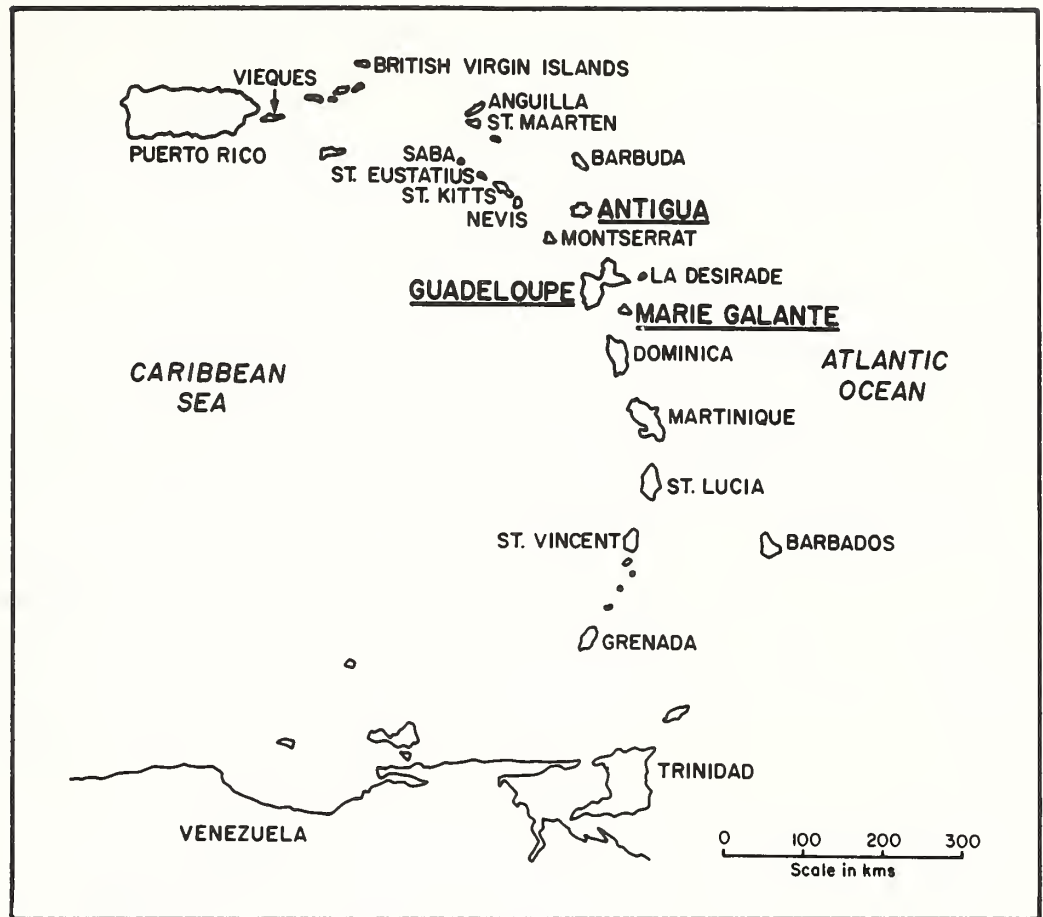
An international campaign to eradicate rinderpest from Africa started on December 1, 1984, with 28 countries participating. Some of these countries do not have the disease; others have it but do not report it. Besides Africa, India appears to be affected, with a spillover into Nepal, but no firm reports of this have been received.

No reports were received on swine vesicular disease. However, African swine fever caused new losses in Sardinia, Malawi, and a flareup in Cameroon. Also, reports of hog cholera continue to come from most swine producing areas, especially in Europe and certain Central American countries. (Dr. Hans J. Seyffert, 301 436-8285)

Heartwater
and
Dermatophilosis

Heartwater, an acute tickborne disease of ruminants caused by the rickettsia Cowdria ruminantium, was reviewed in the June 1982 issue (10-1). The confirmation of heartwater on the French island of Guadeloupe and the continuing dissemination of an efficient tick vector within the Caribbean region poses a serious threat to the cattle, sheep, and goat industries of much of the Western Hemisphere.

Map of Caribbean with names underlined to show islands on which Cowdria ruminantium was isolated.



Consequently, a joint U.S.-French-Dutch research project was established to study heartwater in the Caribbean. This article summarizes the results of the work of this project on the distribution of heartwater and its vectors in the Caribbean.

The only Amblyomma species identified on domestic ruminants in any of the islands was A. variegatum. This tick was found to be widely distributed on Antigua, Guadeloupe, Marie Galante, Martinique, and Nevis, and to be restricted to the southern part of St. Kitts, the northern and southern part of St. Lucia, the central and western part of St. Maarten, three farms on Montserrat and on St. Martin, two foci on La Desirade, and one focus on Dominica.

Table 1--Occurrence of Amblyomma variegatum ticks, Cowdria ruminantium,
and acute bovine dermatophilosis on 21 Caribbean territories

Territories studied	Tick, Rickettsia, and disease present		
	<u>Amblyomma</u> <u>variegatum*</u>	<u>Cowdria</u> <u>ruminantium</u>	Acute Bovine Dermatophilosis
British Virgin Islands	-	-	-
Anguilla	<u>+</u>	-	-
St. Maarten/St. Martin	+	-	+
St. Barthelemy	-	-	-
Saba	<u>+</u>	-	-
St. Eustatius	<u>+</u>	-	-
St. Kitts	+	-	+
Nevis	+	-	+
Barbuda	-	-	-
Antigua	+	+	+
Montserrat	+	-	+
Guadeloupe	+	+	+
La Desirade	+	-	+
Marie Galante	+	+	+
Les Saintes	-	-	-
Dominica	+	-	+
Martinique	+	-	+
St. Lucia	+	-	+
Barbados	<u>+</u>	-	-
St. Vincent and the Grenadines	-	-	-
Grenada	-	-	-

* - = ticks absent; + = occasional tick found; + = tick established.

Two A. variegatum ticks were found on Barbados and one on Anguilla. There was one farmer on St. Eustatius who provided convincing evidence that he had recently seen A. variegatum ticks on that island. One farmer on Saba reportedly had

purchased an A. variegatum-infested cow from St. Maarten in 1981, but no further findings of that tick had been reported on Saba. No A. variegatum ticks were found on or reported from Barbuda, the British Virgin Islands, Grenada, Les Saintes, St. Barthelemy, or St. Vincent and the Grenadines.

C. ruminantium was isolated from A. variegatum ticks from three Caribbean islands: Guadeloupe, Marie Galante, and Antigua. Furthermore, fatal heartwater infections were observed and confirmed at necropsy in goats and cattle on Guadeloupe and in sheep on Antigua.

During the tick survey, numerous cattle on some islands were observed to be suffering from acute dermatophilosis (Table 1). Some affected animals died. Acute dermatophilosis was only seen in herds infested with A. variegatum, and questioning of the owners and veterinary authorities revealed that bovine dermatophilosis had never been a disease problem on any island until after the introduction of A. variegatum. Clinical dermatophilosis was prevalent in cattle on Antigua, Guadeloupe, Marie Galante, Martinique, and Nevis where A. variegatum was widely distributed, and was restricted to those areas of Dominica, La Desirade, Montserrat, St. Kitts, St. Lucia, and St. Maarten/St. Martin where A. variegatum was known to occur. Furthermore, some months after A. variegatum ticks had spread to new premises on St. Kitts, dermatophilosis was first seen as a clinical problem in cattle.

Three facts have now become clear concerning A. variegatum and heartwater in the Western Hemisphere: (a) C. ruminantium is present on at least three islands; (b) a natural vector of C. ruminantium, the tick A. variegatum, is widely distributed in the Caribbean; and (c) the presence of the tick A. variegatum is closely associated with the development of acute dermatophilosis in cattle herds. In addition, experimental vectors of C. ruminantium, the ticks A. maculatum and A. cajennense, are widely distributed in the Western Hemisphere. It is evident, therefore, that consideration should be given to development of an Amblyomma tick eradication program in the Caribbean so that acute dermatophilosis can be controlled and heartwater eliminated from the region. (Dr. Michael J. Burridge, Center for Tropical Animal Health, University of Florida; 904 392-1841)

Parent
Committee

The Parent Committee on Foreign Pathogens and Vectors is comprised of 11 members from agencies of the U.S. Department of Agriculture--Animal and Plant Health Inspection Service (Veterinary Services and Plant Protection and Quarantine), the Cooperative State Research Service, and the Agricultural Research Service--and one member from the U.S. Public Health Service. It is the responsibility of this committee to advise the VS Deputy Administrator on matters of policy for the importation and interstate movement of livestock pathogens and vectors.

The staff veterinarian for Organisms and Vectors, Import-Export

Animals and Products Staff, serves as the secretary of the committee, and is responsible for preparing the agenda. Meetings are held approximately quarterly. Applications for permits to import organisms and vectors of an unusual or controversial nature, or to transport them interstate, and requests for interstate transportation permits are referred to the committee by the secretary for evaluation. The committee reviews the applications and makes a recommendation to the Deputy Administrator as to whether a permit should be issued or denied. The primary concern of the committee members is to prevent the introduction of foreign animal diseases into the United States. (Dr. Laura Peterson, 301 436-8017)

FMD
Surveillance
in
Mexico

Surveillance activities of the Mexican-American Commission for the Prevention of Foot-and-Mouth Disease (CPA) during 1984 on a total of 185 reports of vesicular diseases in Mexico led to the diagnosis of New Jersey type vesicular stomatitis (NJVS) on 94 premises and Indiana type vesicular stomatitis on one premises. All but two (1 equine, 1 porcine) of these occurrences were in cattle. In 1983, the investigation of 235 reported occurrences of vesicular diseases disclosed NJVSV on 119 premises (FAD Report 12-1).

Of the total 185 reports last year, 162 were considered vesicular and the remaining 23 were due to nonvesicular causes, including contagious ecthyma, mastitis, malignant catarrhal fever, cactus spines in the mouth, bovine viral diarrhea, cowpox, trauma, anaplasmosis, and herpes mamillitis. Also, in the 94 affected bovine herds, lesions were reported in the mouth in 61 percent, in both mouth and on teats in 13 percent, on teats in 24 percent, and in both mouth and on feet in 2 percent. Even though horses were present on 49 premises with cattle infected with vesicular stomatitis, on only 6 premises (12 percent) were the horses also affected. Pigs on 25 premises with cattle infected with vesicular stomatitis were not affected. In contrast, on the only premises where an outbreak of NJVS occurred in pigs there were 500 heads of cattle, but none of the cattle were affected with vesicular stomatitis.

Sixty percent of the herds with NJVS were affected during a 17-week period from mid-July to mid-November, with peak incidence during the week of August 20-26, 1984. There was little evidence of the introduction of cattle during the month before onset of the disease in affected herds. In 85 of the 94 affected herds, there was no history of the introduction of cattle to explain the occurrence of vesicular stomatitis. The largest number of affected herds were found in enzootic areas in Veracruz (24 herds) and Michoacan (14 herds).

Mexico has been free of foot-and-mouth disease since 1954. (Adapted from the Mexico-U.S. FMD Program Quarterly Report, October 1-December 31, 1984)

What Was It?

For the readers who have not yet identified the animals in the photograph on page 3 of the December issue (12-4), they are white-bearded wildebeest, Connochaetes taurinus albojubatus. (Editor)

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